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Callous plane

The invention relates to a callous plane having a blade head and a handle, where the callous plane has an underside facing the body surface of the user when in working position, and an upper side facing away from said underside, and where a holding device with a lower holding part and an upper holding part is provided in the blade head, in which a blade can be held in such a manner that its cutting edge intended for use to shave off callous skin is located on the underside of the callous plane.

Callous planes display a razor-like, sharp blade, which should be located in the callous plane with particular protection and as safely as possible, meaning, among other things, in dimensionally and positionally stable fashion. These blades customarily display two cutting edges, located on opposite sides of the blade. For example, a customary callous plane of the kind mentioned in the opening paragraph displays a holding device in which the blade is fastened to an upper holding part by a lower holding part, as a result of which the blade is covered from above. On the underside, however, the lower part forms a discontinuity of shape, where the cutting edge and its corners project dangerously.

To protect the blade better, EP 1 216 664 A2 proposes that the blade be embedded in a holding device made of plastic. In this context, the holding device and the blade form an integral unit, which is fastened to the callous plane. Although the corners of the cutting edge are covered in this way, the spare cutting edge expediently remains free, apart from its corners,

constituting a corresponding risk of injury, since the unit has to be rotated through 180° on the callous plane in order to use the spare cutting edge. A further disadvantage is the complexity of the process for embedding the blade in an exact plastic moulding, this additionally entailing the problem of adhesion between the metallic material of the blade and the plastic, as well as the necessary, secure holding of the extremely thin, hard and sharp-edged blade in the plastic bed, meaning that dangerous, premature loosening of the blade cannot be ruled out. In addition, the fit of the unit on the callous plane can become loose as a result of rotation of the unit for use of the spare cutting edge.

The object of the invention is therefore to provide a callous plane of the kind mentioned in the opening paragraph that is less complex to manufacture and safer to handle.

The object is solved by providing a callous plane of the kind mentioned in the opening paragraph, the lower holding part of which is permanently connected to the handle and displays an upward-pointing seat for the blade, and whose upper holding part holds the blade tightly in the seat with the help of a fixing device.

In this way, a relatively uncomplicated design solution is proposed that does not provide for a two-part nature of the holding device on the underside, thus meaning that no displacement or loosening of the holding parts can occur on the underside. Furthermore, this makes it possible to avoid shoulders or other discontinuities of shape on the underside, which, according to the prior art, are formed by the lower holding part when the upper holding part is connected to the handle, and which can dangerously catch when using the plane on elevated areas of skin, for example, thus possibly leading to dangerous jumping of the callous plane. Furthermore, the blade is integrated in the lower profile line and does not project dangerously beyond

it. This fact can additionally be exploited for conceiving an attractive design.

Consequently, it is advantageous if, in a development, the underside of the blade head can transition smoothly from the lower holding part into the underside of the handle. The lower holding part can moreover be joined to the handle in one piece. Thus, a continuous profile line is proposed, which further facilitates handling of the callous plane, thus making it safer. This makes it possible, for example, for the pitch, i.e. the angle at which the blade slides over the body surface to be treated, to be changed safely, without elevated callous skin catching or getting stuck in discontinuities of shape on the underside of the callous plane, such that the callous plane can unexpectedly jump as a result of being torn away from these elevations. In addition, this makes it possible to create a particularly attractive, aesthetic shape with a continuous profile line, this increasing the general acceptance of a callous plane.

In a preferred development, the lower holding part can cover the entire underside of the held blade, apart from the middle section of the cutting edge intended for use. This avoids a danger of injury by the spare cutting edge from the underside, this particularly being likely to occur when returning the callous plane to its starting position, in that the callous plane is usually moved in the cutting direction of the spare cutting edge during this process. Furthermore, this again contributes to an attractive design.

From its top side, the blade head can essentially cover the held blade, apart from a middle section of its cutting edge. This permits safer and easier handling of the blade from above, e.g. when fixing the blade by pressing the upper holding part against the lower holding part. Moreover, in a further embodiment, the profile line of the upper side can transition

smoothly from the blade part into the handle. This can, in turn, contribute to enhancing the design of the callous plane.

The underside of the upper holding part and the upper side of the lower holding part can display curved shapes running roughly parallel to each other, the neutral axis of which runs in the working direction of the callous plane, such that the held blade is located between the holding parts under bending stress. Bending of the blade increases the dimensional stability of the blade. Furthermore, the bent blade acts like a leaf spring between the holding parts, pressing the holding parts against the fixing means yet to be described, such that the holding parts can be held in a more stable position relative to each other.

In this context, provision can be made, in accordance with customary callous planes, for the holding parts to be laterally curved upwards, and for the working direction to run in the longitudinal axis of the callous plane, from the blade head to the handle. Easy introduction of force into the blade via the handle is possible in this context. The working direction can, however, also run parallel to the underside and perpendicular to the longitudinal axis, as a result of which the callous plane is moved sideways and thus capable of reaching areas of the body surface that are otherwise difficult to reach. Furthermore, provision can be made for the holding device to be rotatable into different working directions, preferably into the two working directions mentioned above, and/or for the blade to be insertable into the seat in such a way that its cutting edge points in a desired working direction.

In a development of the callous plane according to the invention, the lower holding part displays a blade opening, through which the cutting edge of the blade can be passed in such a way that at least a middle longitudinal section of the cutting edge projects beyond the edge of the blade opening on the underside

of the lower holding part by a small distance perpendicular to the working direction. In this context, the contour of the blade opening can, for example, correspond to a circular arc with a radius running in the working direction. This distance ultimately determines the maximum thickness of the particles of callous skin to be shaved off. This distance can be adjustable, e.g. in that the blade can be pushed farther out through the blade opening.

Furthermore, additional, laterally arranged covers can be provided for laterally covering the side edges without a cutting edge and/or the spare cutting edge of the blade.

The seat can be designed as a trough in the upper side of the lower holding part, where the blade opening for exposing the middle area of the cutting edge intended for use is located on the base of the trough on the underside of the lower holding part.

Preferably, the bend radius of the underside of the lower holding part can be designed to be smaller than the bend radius of the underside of the upper holding part, at least in the area of the blade opening. As a result, the held blade is bent correspondingly more strongly than the underside of the lower holding part, thus projecting farther beyond the blade opening in the middle. Furthermore, the underside of the lower part can also be slightly bent in the longitudinal direction, such that an underside with a slight convex arch results. Due to this arched underside, the callous plane adapts more easily, and thus more safely, to the area of the body to be treated. Furthermore, the longitudinal section of the cutting edge projecting through the opening is thus more easily accessible from below and therefore needs to project less far through the opening in order to shave off callous skin.

The fixing device preferably displays a guide device for guided

insertion of the blades into the seat, and for inserting the two holding parts into each other. This guide device can, for example, display guide prongs that are located at the corners of the seat and extend upwards, where the held blade and the upper holding part laterally rest against the guide prongs. As a result, the held blade is held on several sides, meaning that the blade can safely be pressed against the lower holding part, particularly while simultaneously building up bending tension in the blade, since the blade cannot slip out of the seat laterally. In a development, the sides of the guide prongs against which the held blade lies can be of pyramidal design, this facilitating insertion of the blade into the seat.

To enable safe insertion of the blade into the seat, a development of the invention provides an insertion trough on both longitudinal sides of the seat for inserting the blade, held between two fingers, into the seat. These insertion troughs are expediently covered by the upper holding part, as a result of which the user is guarded against any possible projection of the blade.

In an advantageous development, the two holding parts are connectable by a plug-in connection on one side and have a snap-in connection on the opposite side. In this context, the plug-in connection can display two parallel plug-in projections on the upper holding part, which are a distance away from each other, extend in the working direction and can be guided against a stop under two corresponding retaining projections that are a distance away from the base of the seat and from each other, where the side faces of the projections that face each other slide on each other according to the principle of the inclined plane. Once the blade has been mounted in the seat, the plug-in projections of the upper holding part can be inserted under the retaining projections of the lower holding part and locked in place on the lower holding part in a pivoting movement by pressing the two holding parts together. As a result of this

pivoting movement, the side faces of the projections that face each other slide over each other, this being facilitated by sloping these side faces. Other designs of the side faces are also conceivable, such as a convex side face of the retaining projection that slides on a side face of the plug-in projection of corresponding, concave design. Instead of via a plug-in connection, the upper holding part can be fixed to the lower holding part in pivoting fashion via a joint. Expediently, a section of the blade can be slid under the retaining projections for insertion in the seat. The blade is fixed in the seat as a result and can be pressed more safely against the lower holding part by the upper holding part.

In another embodiment of the fixing device, a tongue-and-groove guide can be provided, by means of which, as described in more detail below, the upper holding part can be guided via the lower holding part, preferably in the working direction. In this context, the tongue-and-groove guide can display a guide rail and a guide groove with a dovetail-type cross-section, for example, as a result of which a tighter fit of the guide rail in the guide groove is achieved perpendicular to the longitudinal direction, and the risk of the upper holding part expanding under the contact pressure of the blade is minimised. In another design, the cross-section of the guide can display a unilateral dovetail shape with inside groove surfaces that run roughly parallel to each other and at an angle other than 90° to the groove opening, as a result of which only one undercut is thus formed. This undercut can be located on the lower inside groove surface in this context. The tongue-and-groove guide can furthermore be provided on lateral inside surfaces of the lower holding part, as a result of which the upper holding part is correspondingly located on the inside, in or above the seat for the blade, and/or on lateral outside surfaces of the lower holding part. As a result, the upper holding part can, for fitting into the tongue-and-groove guide, reach over the lower holding part from above and thus completely cover the

seat, and consequently the held blade, from above.

In another embodiment of the fixing device, a combination of the fixing methods described above is proposed, i.e. preferably of the tongue-and-groove guide and the plug-in connection. It goes without saying that the scope of the invention also covers other fixing methods that hold the blade in the seat in suitable fashion by means of the upper holding part.

The fixing device can furthermore display snap-in means, by means of which the upper holding part and the lower holding part can be snap-fitted to each other. It should preferably be possible for the upper holding part to be snap-fitted by the snap-in means without further tools, by pressing it against the lower holding part. To this end, the one holding part can display at least one snap hook pursuant to the prior art. In this context, the snap hook can be located laterally on one of the holding parts and laterally reach around the other holding part for snap-fitting, its free end with the transverse hook end section lying under bending stress against the side of the other holding part facing away from the one holding part. In this context, a recess can be provided at this point, being engaged by the transverse hook end section at least in such a way that it does not project beyond the underside of the blade head. The end of the snap hook can furthermore display another extension, preferably running at right angles to the hook end and perpendicular to the working direction, by means of which it engages an opening or the like provided in the other holding part, as a result of which a positive and non-positive connection can be achieved between the two holding parts. In another embodiment, the snap hook can display lateral extensions which, after overcoming a projection or the like located on the other holding part by elastic bending of the snap hook, can engage lateral recesses, such as pockets or the like, provided on the other holding part.

A pressure hollow for pressing the upper holding part against the lower holding part can be provided on the upper side of the upper holding part, in order to ensure a firm hold for a pressure-exerting finger of the user. This pressure hollow can furthermore be used for pressing of the callous plane against an underlying surface by the finger of the user, this permitting the easy and controllable application of pressure of the callous plane against the underlying surface. This pressure hollow is preferably of ergonomic design. Furthermore, the pressure hollow can be located on the free end of the blade head, and thus remotely from the cutting edge intended for use. Furthermore, the snap-in means, particularly the snap hook, can be designed and located in such a way that they can be released by operating the pressure hollow.

In a development, a through-passage for collecting and ejecting shaved-off callous skin particles is provided in the upper holding part, said through-passage being located above the blade opening when in working position. The through-passage expediently widens conically towards the upper side of the upper holding part, the inner wall of the through-passage facing towards the free end of the blade head displaying a run-off slope, via which the shaved-off callous skin particles can run off in a direction opposite the working direction. This prevents callous skin particles from sliding in between the blade and the holding part, thereby blocking the blade.

The handle of the callous plane can display a handle part at its free end and a connecting section at its end facing the blade head. In this context, an eyehole leading from the upper side to the underside can be let into the connecting section in order to give a view of the body surface of a user to be treated. The eyehole can be laterally bordered by two webs arranged in the manner of a fork. The eyehole can furthermore widen conically towards the top in order to permit the widest possible view of the surface to be treated as a result. A mag-

nifier at least partly filling the eyehole can be provided in the eyehole for optical magnification of the view of the surface to be treated, this facilitating accurate and safe working.

The handle part can be ergonomically adapted to the hand of the user. To this end, one possible embodiment of the handle part essentially display two sections, a section for the ball of the thumb, extending to the free end, and a section for the fingers, adjacent to the connecting section. In this context, lateral, convex padded grips can be provided on the section for the ball of the thumb for adaptation to the palm of the user and/or finger recesses can be provided in the section for the fingers.

The surface of the handle part can expediently be made, at least in part, of anti-slip and/or supple material. Coating with an anti-slip material is also conceivable. The handle part lies particularly securely in the user's hand as a result.

The section for the fingers can preferably display several finger recesses around the circumference. In the event of a rectangular cross-section of the section for the fingers, for example, finger recesses can be provided on all four outer surfaces. As a result, when rotated in the hand, the callous plane can be securely held in at least four positions, meaning that the callous plane can be safely guided over the skin surface with the handle in various positions in the hand. This is particularly advantageous if the underside of a part of the body is to be treated with the callous plane, such that the underside of the callous plane with the cutting edge of the blade points upwards against the direction of gravity.

The callous plane can be made of plastic. The callous plane can preferably be manufactured as an injection moulding. In this context, the lower holding part can be connected to the handle

in one piece. Furthermore, the upper holding part can be connected to the lower holding part in one piece, e.g. via a film hinge.

The present invention is described in more detail below on the basis of three practical examples and an associated drawing. The Figures show the following:

Fig. 1 A perspective top view of a first practical example of a callous plane, with an upper holding part,

Fig. 2 A perspective top view of the callous plane according to Fig. 1, without upper holding part and with inserted blade,

Fig. 3 A bottom view of the callous plane according to Fig. 1, with blade,

Fig. 4 A perspective top view of the upper holding part of the callous plane according to Fig. 1,

Fig. 5 A schematic representation of a cross-sectional area according to the point marked by line A-A in Fig. 3,

Fig. 6 A perspective top view of a second practical example of the callous plane according to the invention, without upper holding part and with inserted blade,

Fig. 7 A perspective top view of the upper holding part of the callous plane according to Fig. 6,

Fig. 8 A schematic representation of a cross-sectional area of the callous plane according to Fig. 6, without upper holding part and with inserted blade in the free end area,

Fig. 9 A schematic representation of a cross-sectional area as in Fig. 8, but with inserted upper holding part,

Fig. 10 A schematic representation of a middle longitudinal sectional area of the free end of the blade head,

Fig. 11 A perspective top view of a third practical example of the callous plane according to the invention, with an upper holding part,

Fig. 12 A perspective top view of the callous plane according to Fig. 11, without upper holding part and with inserted blade,

Fig. 13 A perspective bottom view of the callous plane according to Fig. 11, without upper holding part,

Fig. 14 A perspective top view of the upper holding part of the callous plane according to Fig. 11, and

Fig. 15 A perspective bottom view of the upper holding part of the callous plane according to Fig. 11.

Based on Figs. 1 to 5, a first practical example of a callous plane 1 according to the invention is explained, indicating working direction X. Figure 1 shows callous plane 1 with a blade head 2 and a handle 3 in a perspective top view, where callous plane 1 displays an underside, facing the skin surface of a user to be treated when in working position, and an upper side. Provided in blade head 2 is a holding device 4, in which a blade 5 can be held in such a way that its cutting edge 6 for shaving off callous skin not shown here, which is hardly visible in this illustration due to being concealed, is located on the underside of callous plane 1. Holding device 4 displays a lower holding part 7 with an upward-facing seat 8 for blade 5, and an upper holding part 9 for pressing and fixing blade 5 in

seat 8 by means of a fixing device. In this context, lower holding part 7 is connected to handle 3 in one piece. While seat 8 is concealed by upper holding part 9 in Fig. 1, it is revealed in Fig. 2. Blade 5 is essentially covered by upper holding part 9, except for a middle area of cutting edge 6.

Figure 2 shows a perspective top view of callous plane 1, without the upper holding part and with blade 5 located in seat 8. A customary blade 5 with two cutting edges 6, 10 is shown here, where, in the position illustrated here, cutting edge 6 is used, whereas the other, as spare cutting edge 10, is concealed by upper holding part 9 and, as will be explained in more detail on the basis of Fig. 3, by lower holding part 7. It goes without saying that other blade forms can also be used, for which modifications of the holding parts, obvious to a person skilled in the art who is familiar with this teaching, would possibly be necessary.

Figure 3 shows a bottom view of callous plane 1. The underside of lower holding part 7 transitions continuously into the underside of handle 3 in this context. Furthermore, the underside of blade head 2 covers held blade 5, apart from a middle section of its cutting edge 6, where lower holding part 7 displays a blade opening 11, through which part of cutting edge 6 of blade 5 passes. The underside of upper holding part 9 and the upper side of lower holding part 7 run roughly parallel to each other and display a curved shape, the neutral axis of which runs roughly in working direction X of callous plane 1. As a result, blade 5, located between holding parts 7, 9, is subjected to bending stress, by means of which blade 5, acting in the manner of a leaf spring, forces the two holding parts 7, 9 apart against fixing means to be described in more detail. This achieves greater positional stability of holding parts 7, 9, and of blade 5 located therein.

Furthermore, the undersides of the two holding parts 7, 9 are

curved, where, as indicated in the drawings, the bend radius of the underside of lower holding part 7 is smaller, at least in the area of blade opening 11, than the bend radius of the underside of upper holding part 9. As a result, blade 5 displays a more strongly curved elastic line than the area around blade opening 11, meaning that the blade projects farther beyond blade opening 11 in the middle than towards the edge. This permits targeted and fine shaving of callous skin particles.

Figure 4 shows a perspective top view of upper holding part 9. In this context, upper holding part 9 displays two plug-in projections 12, which extend in working direction X and can each be passed under two retaining projections 13, shown in Fig. 2, and against a stop 14, where the side faces of projections 12, 13 that face each other slide over each other according to the principle of the inclined plane. To this end, the corresponding side face 15 of plug-in projections 12 in the practical example illustrated here is designed as a concave side face 15 with an inward-leading radius. Retaining projections 13 display a distance from the base of the seat that is adapted to plug-in projections 12. As can further be seen in Fig. 2, the corners of cutting edge 6 of inserted blade 5 pass under retaining projections 13. The corners are covered as a result. This furthermore holds blade 5 in a stable position.

Furthermore, a guide device is provided for guided insertion of blade 5 into seat 8, and for inserting the two holding parts 7, 9 into each other. In this context, the guide device displays guide prongs 16, which are located at the corners of seat 8 and extend upwards. Held blade 5 rests laterally against guide prongs 16, as a result of which blade 5 is held in dimensionally and positionally stable manner in the blade plane. Furthermore, as shown in Fig. 1, laterally extending guide projections 32 of upper holding part 9 likewise rest laterally against guide prongs 16, meaning that improved positional stability of blade 5 is likewise achieved in this way.

The end of upper holding part 9 opposite guide prongs 16 displays two guide hooks 17, which, as can be seen in Fig. 1, reach over the free end of lower holding part 7 at the face end when in installed position, this achieving further improvement of the positional stability of upper holding part 9, as well as of blade 5 mounted between holding parts 7, 9. Furthermore, upper holding part 9 is provided with a snap hook 18, which is located between and at a parallel distance from the two guide hooks 17 in the manner of a leaf spring and likewise reaches over the free end of lower holding part 7 at the face end. In this context, snap hook 18 engages a recess 19 in the underside of lower holding part 7 in such a way that it rests against the underside under bending stress. Provision is additionally made for side faces 31, with which guide prongs 16 laterally rest against blade 5 and upper holding part 9 when in holding position, to taper pyramidally upwards in order to facilitate the insertion of blade 5 and the engaging of upper holding part 9 in lower holding part 7.

A pressure hollow 20 is additionally provided on the upper side of upper holding part 9 for pressing callous plane 1 against an underlying surface (not shown). Since this pressure hollow 20 is located directly above blade 5 when in installed position, the user can insert a finger here to specifically exert pressure on blade head 2. Furthermore, the two holding parts 7, 9 can be pressed together safely via this pressure hollow 20 by the user acting on the upper and lower side of blade head 2.

As can be seen in Fig. 3, lower holding part 7 displays two insertion recesses 21 on its longitudinal sides, these facilitating insertion of blade 5 into seat 8. Insertion recesses 21 are covered by upper holding part 9 when the two holding parts 7, 9 are assembled, such that the side edges of the inserted blade without a cutting edge are likewise completely covered from above.

Callous plane 1 is provided with a through-passage 22 for collecting and ejecting shaved-off callous skin particles (not shown), where through-passage 22 is located above blade opening 11 when in working position. On its inner wall facing away from the handle, this through-passage 22 displays a run-off slope 23, which is clearly visible in Fig. 4 and runs in the direction opposite to working direction X. This facilitates the ejection of shaved-off callous skin particles, which run off via run-off slope 23, simultaneously preventing these particles from dangerously congesting blade 5.

As schematically indicated in Fig. 2, handle 3 of callous plane 1 essentially displays three sections, a connecting section 24, a section for the fingers 25 and a section for the ball of the thumb 26. In this context, connecting section 24 is provided with a triangular eyehole 28, laterally bordered by two fork-like webs 27, for viewing the surface to be treated, which lies downstream of cutting edge 6 in working direction X. Eyehole 28 is expediently designed with a slight conical taper towards the bottom.

The section for the fingers 25 and the section for the ball of the thumb 26 form the actual handle area of handle 3 and are ergonomically adapted to the user's hand. To this end, in this embodiment of callous plane 1, the section for the fingers 25 displays finger recesses 29, and the section for the ball of the thumb 26 displays laterally located, convex padded grips 30. These padded grips 30 are preferably made of anti-slip and/or supple material. Anti-slip coating of padded grip 30 is also conceivable. Handle 3 can likewise be partly or completely provided with an anti-slip surface or made of anti-slip material.

The section for the fingers 25 displays an essentially rectangular cross-section with four side walls with rounded edges, where each of the side walls is provided with a finger recess

29, such that the overall cross-sectional shape is as illustrated schematically in Fig. 5. As a result, a secure and ergonomically adapted fit of handle 3 in the hand of the user is still possible when handle 3 is in a rotated position in the hand of the user, such that callous plane 1 can be gripped securely and guided safely in various positions in the hand.

Figures 6 to 10 illustrate a second practical example of callous plane 1. In contrast to the previously described example, callous plane 1 in this case displays a different fixing method for fixing upper holding part 9 on lower holding part 7. To this end, as can be seen in the perspective top view of upper holding part 9 in Fig. 7, lateral guide rails 33 are provided in upper holding part 9, extending in the longitudinal direction.

It can be seen in Fig. 6, a perspective top view of lower holding part 7 with inserted blade 5, that guide prongs 16 display guide grooves 34, adapted to guide rails 33, for guiding upper holding part 9 during connection of the two holding parts 7, 9, where upper holding part 9 can be slid over lower holding part 7 in working direction X. Guide grooves 34 run accordingly on the inner side of guide prongs 16 and in the longitudinal direction of lower holding part 7. In order to bend inserted blade 5 as intended when joining the two holding parts 7, 9, it is expedient that, in order to bend blade 5, upper holding part 9 can, in a first step, be guided from above, i.e. perpendicular to the blade plane, against blade 5 and, in a further step, connected to lower holding part 7 by engaging guide rails 33 and guide grooves 34 in working direction X. To this end, gaps a are provided between guide rails 33, which face towards the free end of callous plane 1 in installed position, and guide projections 32, through which end guide prongs 16 can be passed perpendicular to the blade plane.

Figures 8 and 9 each schematically illustrate a cross-sectional

area through blade head 2, roughly at the level of end guide prongs 16, without and with upper holding part 9 inserted in seat 8, respectively. This is intended to demonstrate the position of blade 5 in seat 8 between holding parts 7, 9. In Fig. 8, blade 5 lies loosely in seat 8, distance b being provided between guide grooves 34 and the upper side of inserted blade 5 to prevent lateral slipping of blade 5 into guide grooves 34. In Fig. 9, guide rails 33 of upper holding part 9 are inserted in guide grooves 34 of lower holding part 7, the downward-curved shape of upper holding part 9 pressing blade 5 downwards, such that blade 5 rests against the underside of upper holding part 9 under tension, at least in a middle area.

The representations shown in Figs. 8 and 9 are merely intended to illustrate the principle according to which blade 5 is held in holding device 4. Consequently, other embodiments realising this principle also fall within the scope of this invention.

In the second practical example, guide rails 33 and guide grooves 34 display a dovetail-type cross-section. As a result, the force transmitted through downward-curved blade 5 to upper holding part 9 is introduced obliquely into lower holding part 7 in force direction K, roughly in accordance with the curved upper side of upper holding part 9. In contrast to horizontal introduction of a force generated by the tension of blade 5, this at least essentially reduces the danger of possible expansion of lower holding part 7.

Figure 10 shows a schematic representation of a longitudinal sectional area in the centre line of the free end of blade head 2, with snap hook 18 projecting beyond the end of lower holding part 7. In contrast to the first practical example, snap hook 18 in this case reaches around snap-in projection 35, provided on the end of lower holding part 7, and into a snap-in groove 36, resting against snap-in projection 35 and/or snap-in groove 36, preferably under tension. In the event of motion of upper

holding part 9 relative to lower holding part 7 in a direction opposite to working direction X, this prevents snap hook 18 from releasing itself prematurely from snap-in projection 35, meaning that the two holding parts 7, 9 are reliably fixed in blade head 2. This fixing is additionally intensified by the frictional forces occurring between guide rail 33 and guide groove 34, and by the tensioned blade 5.

To protect against premature release of snap hook 18 from snap-in projection 35, a thicker area 37 is provided in working direction X, preferably transitioning continuously into the remaining underside of lower holding part 7 in working direction X.

The thicker area can, as not shown here however, extend farther on the underside in the direction opposite to the working direction, over the snap hook, such that the snap hook thus engages an opening or groove. For easier release of the snap hook, the snap hook can furthermore reach around the snap-in projection with clearance in such a way that, by applying pressure to the upper holding part perpendicular to the working direction, the snap hook can be released from the snap-in groove and guided out over the snap-in projection in a direction opposite to the working direction. It goes without saying that the first practical example, and also the third one following now, can display a similar snap hook design with snap-in groove and/or thicker area.

Based on Figs. 11 to 15, a third practical example of callous plane 1 according to the invention will now be described, where Figs. 11, 12 and 15 show a perspective top view and Figs. 13 and 14 a perspective bottom view of the callous plane or of individual components of the callous plane. In this context, the third practical example essentially differs from the previous practical examples in that it has a different design of the fixing device, which is in principle designed as a combination

of the previously described fixing methods, i.e., in addition to a number of design modifications, primarily a tongue-and-groove guide and a plug-in connection. In this context, a tongue-and-groove guide is provided in the free end section of blade head 2, while the end of blade head 2 facing handle 3 displays a plug-in connection.

As can be seen in Fig. 12, where lower holding part 7 is illustrated, and in Figs. 14 and 15, showing upper holding part 9, upper holding part 9 displays two plug-in projections 12, extending in working direction X, which can each be guided under two retaining projections 13 of lower holding part 7 and against a stop 14. In this context, the side faces of projections 12, 13 that face each other are arranged to slide over each other according to the principle of the inclined plane. Retaining projections 13 expediently display a distance from the base of seat 8 that is adapted to plug-in projections 12, so that the corners of cutting edge 6 of blade 5 inserted in seat 8 can be passed under retaining projections 13. This covers the dangerous corners of cutting edge 6, additionally holding blade 5 in a stable position.

In contrast to the second practical example, lateral guide rails 33 are, as illustrated in Figs. 12 and 13, located on the free end of lower holding part 7 and extend in their longitudinal direction only up to insertion recess 21 provided for inserting blade 5 into seat 8. Accordingly, guide grooves 34, not visible in Figs. 14 and 15 due to being covered, are provided for upper holding part 9, their cross-section and length being adapted to guide rails 33. The cross-section of guide rails 33 and of guide grooves 34 displays a customary, dovetail-type shape, with the help of which displacement perpendicular to the longitudinal direction is prevented. To simplify the object, the dovetail shape is designed with only one undercut in this context, the transverse extension of guide rails 33 extending obliquely downwards.

To connect the two holding parts 7, 9, upper holding part 9 can be placed from above on seat 8, over lower holding part 7, only in such a way that it projects so far beyond the free end of lower holding part 7 that guide rails 33 of lower holding part 7 are positioned in front of the start of guide grooves 34, and guide grooves 34 of upper holding part 9 can be slid over guide rails 33 of the lower holding part. In this context, a blade 5 inserted in seat 8 is pressed down towards the base of the seat, building up bending stress in the process. Introduction of guide rails 34 into corresponding guide grooves 33 in working direction X of callous plane 1 enables guided displacement of upper holding part 9 in working direction X, such that plug-in projections 12 of upper holding part 9 can be passed under retaining projections 13 of lower holding part 7 until plug-in projections 12 rest against stop 14.

For tighter positioning, guide hooks 17 are, in contrast to the first practical example, each fitted with an additional guide hook projection 38, which extends in working direction X and, in assembled state of holding parts 7, 9, engages a correspondingly adapted guide hook recess 39 located on the underside of lower holding part 7. In this context, guide hook projection 38 and guide hook recess 39 are preferably dimensioned in such a way that guide hook projection 38 does not project downwards beyond the underside of lower holding part 7.

The snap hook 18 provided is, as in the preceding practical examples, located between and at a parallel distance from guide hooks 17, in the manner of a leaf spring, and reaches over the free end of lower holding part 7 at the face end. As a result, snap hook 18 can be moved back and forth to a certain degree about a pivoting axis perpendicular to working direction X. In contrast to the preceding examples, snap hook 18 displays laterally arranged snap-in wings 40, which, for the purpose of locking, can each be guided via snap-in projection 35, located

on the underside of lower holding part 7, into snap-in groove 36, which is located downstream thereof in working direction X and designed as a pocket. To release it, snap hook 18 can be pressed downwards perpendicular to working direction X, so that snap-in wings 40 can be guided over the respective snap-in projections 35 by displacing upper holding part 9 in the direction opposite to working direction X. As can particularly be seen in Figs. 11 and 13, the fixing device, with guide hooks 17 and snap hooks 18 leading to the underside of lower holding part 7, is dimensioned in such a way that callous plane 1 displays a smooth, continuous underside that therefore does not interfere with the use of callous plane 1.

The practical examples of callous plane 1 illustrated here are manufactured as a two-part, plastic injection moulding with two components, the lower holding part 7, connected to handle 3, and the upper holding part 9. It is also conceivable to manufacture the callous plane as a one-part injection moulding, in that the lower and the upper holding part are connected to each other in one piece via an integrally moulded joint, such as a film hinge.

Mozart AG

D-42655 Solingen

Callous plane

List of reference numbers

1	Callous plane
2	Blade head
3	Handle
4	Holding device
5	Blade
6	Cutting edge
7	Lower holding part
8	Seat
9	Upper holding part
10	Spare cutting edge
11	Blade opening
12	Plug-in projection
13	Retaining projection
14	Stop
15	Side face
16	Guide prong
17	Guide hook
18	Snap hook
19	Recess
20	Pressure hollow
21	Insertion recess
22	Through-passage
23	Run-off slope
24	Connecting section
25	Section for the fingers
26	Section for the ball of the thumb

27	Web
28	Eyehole
29	Finger recess
30	Padded grip
31	Side face
32	Guide projection
33	Guide rail
34	Guide groove
35	Snap-in projection
36	Snap-in groove
37	Thicker area
38	Guide hook projection
39	Guide hook recess
40	Snap-in wing
a	Distance
b	Distance
X	Working direction
K	Force direction